

APPLICATION
FOR
UNITED STATES LETTERS PATENT

TITLE: **WEDGE THREAD WITH TORQUE SHOULDER**

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PATENT TRADEMARK OFFICE

Wedge Thread With Torque Shoulder

Cross-reference to related applications

This application is a continuation-in-part application of U.S. Application Serial No. 09/294,889, filed April 19, 1999.

Field of the Invention

[0001] The invention relates to threaded tubular joints usable in oil and gas well drilling and production, such as tubing, casing, line pipe, and drill pipe, commonly known collectively as oilfield tubular goods. More particularly, the invention relates to wedge thread having a positive stop torque shoulder for connecting male (pin) and female (box) members.

Background of the Invention

[0002] The use of threaded tubular connections for joining flow conduits in an end-to-end relationship to form a continuous flow path for transporting fluid under pressure is well known. Oilfield tubular goods all use threaded connections for connecting adjacent sections of conduit or pipe. Examples of such threaded end connections designed for use on oilfield tubular goods are disclosed in U.S. Patent Nos. 2,239,942; 2,992,019; 3,359,013; RE 30,647; and RE 34,467, all of which are assigned to the assignee of the present invention.

[0003] Prior art wedge thread designs offer distinct advantages over other thread designs which include high torsion, high compression, and reliable internal and external pressure sealing capabilities. There are, however, a few issues that require extreme care when designing connection using wedge thread technology. A first issue is designing connections using metal-to-metal sealing interfaces in

conjunction with wedge thread technology. A second issue is the inherent wear characteristics encountered during multiple make and breaks associated with wedge thread technology. The primary problem encountered when trying to incorporate a wedge thread with a conical metal-to-metal seal in the prior art is that a very shallow seal angle is required to compensate for the linear variability of the wedge thread torque stop. This invention incorporates a positive stop torque shoulder in conjunction with the wedge thread, which allows for better axial control of the connection at final make up without sacrificing existing advantages of the wedge thread technology. This better controlled axial location of the connection allows for a steeper metal-to-metal seal angle, thus enhancing characteristics of sealability and galling resistance. The second problem encountered using wedge thread technology is determining when the wedge thread begins to wear to a point that the connection is no longer serviceable as a result of repeated make and breaks. By incorporating a secondary positive stop torque shoulder within the primary wedge thread torque stop configuration, connection wear limitations can be better controlled.

Summary of the Invention

[0004] In one aspect, the present invention relates to a threaded pipe connection including a pin member having an external thread increasing in width in one direction, the external thread including load and stab flanks, a box member having an internal thread increasing in width in the other direction so that complementary internal and external threads move into engagement upon make-up of the connection, the internal thread comprising load and stab flanks, a positive stop torque shoulder, and wherein the width of the internal thread and external thread are selected to provide a selected clearance at least between the internal load and stab flanks and the external load and stab flanks upon initial engagement of the positive stop torque shoulder.